NON-PUBLIC?: N
ACCESSION #: 8805310109
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Callaway Plant Unit 1 PAGE: 1 of 3

DOCKET NUMBER: 05000483

TITLE: Manual Reactor Trip Due To Failure of The 'C' Main Feedwater Regulating Valve
EVENT DATE: 04/21/88 LER #: 88-006-00 REPORT DATE: 05/23/88

OPERATING MODE: 1 POWER LEVEL: 094

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
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COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: SJ COMPONENT: FCV MANUFACTURER: C635
REPORTABLE TO NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: On 4/21/88 at 0217 CDT, a manual reactor trip was initiated immediately following the failure of the 'C' main Feedwater Regulating Valve (FRV), AE-FE-530. The manual reactor trip was followed by a Feedwater Isolation and an Auxiliary Feedwater actuation by design. At the time of the event the plant was in Mode 1, Power Operations at 94% power and a Reactor Coolant System temperature of 587 degrees F and pressure of 2234 psig.

The 'C' main FRV failed due to material fatigue of the roll pin which secures the valve plug to the valve stem. The plug unthreaded and dropped from the stem blocking feedwater flow through the valve.

The roll pin in the 'C' FRV was replaced with a solid pin of greater strength tack welded in position. Additionally, the roll pins in the three remaining FRV's and in the four feedwater bypass valves were replaced with solid pins.

The manual reactor trip and Engineered Safety Features performed as

required. There were no adverse effects on the public health and safety.

(End of Abstract)



Basis for Reportability

On 4/21/88 at 0217 CDT, a manual reactor trip was initiated immediately following the failure of the 'C' main Feedwater Regulating Valve (FRV)(1), AE-FCV-530. The reactor trip was followed by a Feedwater Isolation(2) and an Auxiliary Feedwater(3) Actuation by design.

This report is submitted pursuant to 10CFR50.73(a)(2)(iv) to document a manual actuation of the Reactor Protection System (RPS)(4) and the automatic actuation of the Engineered Safety Features (ESF)(5).

Conditions at the Time of Event

Mode 1 - Power Operations
Reactor Power - 94%
Reactor Coolant System (RCS)(6)
temperature (average) - 587 degrees F
pressure - 2234 psig

Event Description

On 4/20/88 at 2230 CDT, indications of a problem with the 'C' FRV were noted by the Balance of Plant (BOP) operator. The 'C' FRV Main Control Board (MCB) demand signal(7), AE-FK-530, was indicating full open (100%), while the remaining three MCB demand signals were indicating lower values. In an attempt to correct the condition, the 'C' main feedwater (FW) bypass valve(8), AE-FCV-570, was opened and power was reduced to 94.5%. This action lowered the 'C' MCB demand signal indication to less than 100%.

At approximately midnight, the valve stem on the 'C' FRV was mechanically adjusted causing the MCB demand signal indication to decrease from 94% to 84%. By 0110 the demand signal had increased from 84% to 92%. Utility engineering personnel investigating the condition determined that the roll pin, which prevents the plug from unthreading from the valve stem, may have vibrated loose thereby allowing the plug to begin separating from the valve stem. This item was discussed with operators, and the Shift Supervisor determined that a manual reactor trip would be initiated if the FRV failed. The plug provides the same function as a valve disc or gate.

At 0212, a manual plant shutdown was approved in anticipation of a potential 'C' FRV failure. At 0217 a loud noise, caused by a water hammer in the main FW system, was heard in the control room. The noise was in coincidence with the receipt of a seismic recorder MCB annunciator alarm(9) and feedwater mismatch annunciator alarms(10) in all four loops. The shift supervisor immediately directed a manual reactor trip which was followed by an automatic ESF Feedwater Isolation and an Auxiliary Feedwater Actuation.

The emergency plant operating procedures were completed and the plant was stabilized. At 0500 the NRC was notified of the event via a four-hour report pursuant to the requirements of 10CFR50.72(b)(2)(ii).



Root Cause

The root cause of the event is attributed to the failure of the 'C' FRV roll pin which secures the valve plug to the valve stem. The roll pin failure was caused by flow induced fatigue failure.

Corrective Actions and Actions Taken to Prevent Recurrence

The 'C' FRV was disassembled and the roll pin was replaced with a solid pin of greater strength. To ensure the solid pin would not vibrate loose, it was tack welded into position. Since the design of the remaining three FRV's and the four FW bypass valves contained the roll pin configuration, these valves were also modified to include the solid pins.

An engineering evaluation and system walkdown verified no adverse effects on plant system as a result of the water hammer.

Safety Significance

The manual reactor trip and the ESF actuations (Feedwater Isolation and Auxiliary Feedwater Actuation) performed as required. There were no adverse effects on the public health and safety.

Previous Occurrences

None

Footnotes

The system and component codes listed below are from IEEE Standards 805-1983 and 803A-1983, respectively.

(1) System - SJ, Component - FCV
(2) System - JE
(3) System - BA
(4) System - JC
(5) System - JE
(6) System - AB
(7) System - SJ, Component - FIK
(8) System - SJ, Component - FCV
(9) System - IN, Component - ALM
(10) System - JE, Component - ALM
(11) System - JE, Component - P
(12) System - IN, Component - MCBD
(13) System - BA, Component - SIK
(14) System - BA, Component - SIK
(15) System - SJ, Component - ISV
(16) System - KP
(17) System - SJ, Component - SOL



UNION
ELECTRIC
Callaway Plant May 23, 1988

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

ULNRC-1776

Gentlemen:

DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
FACILITY OPERATING LICENSE NPF-30
LICENSEE EVENT REPORT 88-006-00
MANUAL REACTOR TRIP DUE TO FAILURE
OF THE 'C' MAIN FEEDWATER REGULATING VALVE

The enclosed Licensee Event Report is submitted pursuant to 10 CFR 50.73(a)(2)(iv) concerning a manual actuation of the Reactor Protection System and the automatic actuation of Engineered Safety Features.

/s/ for
J. D. Blosser
Manager, Callaway Plant

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